Montana Department of Transportation

DOT HM-126F & OSHA Right to Know
Construction
Training Manual
1994

Contents

General Awareness

1. Introduction

HM 126F training is required under Hazardous Materials Regulations. The purpose of the training is to develop safe work practices for those who work with hazardous materials.

Goal

Develop awareness of hazardous materials in the workplace, how to prevent accidents and incidents, and how to handle hazardous material incidents.

Objective

Participants will demonstrate awareness of how to find hazardous material information from materials safety data sheets, labels, placards, DOT hazardous material tables, shipping papers, and packaging.

Group Activity 1
In a small group-answer the following questions:

1. Make a list of hazard materials with which you work.
2. What haz mat accident could occur in you work area?
3. What are the emergency response steps as outlined in MDT policy?

Hazardous Materials

Hazardous materials are defined as materials which can pose an unreasonable risk to health and safety of people or property.

Hazardous Materials Information

There are a number of resources available to you to help you identify the hazardous materials both in the workplace and in the field. The resources include Material Safety Data Sheets, DOT Hazardous Materials Table, Labels, Placards, and Emergency Response Books.

2. Department of Transportation Hazardous Materials Tables

The Hazardous Materials Table lists materials that the Research and Special Programs Administration has determined: ***May pose an unreasonable risk to health and safety or property when being transported.*** Here are a few that are used in MDT.

Column 2 Hazardous Materials Description and Proper Shipping Names	C-3 HM Class or Div	C-4 ID no.	C-5 Pack-ing group	Column 6 Labels Required
Acetylene	2.1	UN1001		FLAMMABLE GAS
Asphalt, at or above its flashpoint	3	NA1999	III	FLAMMABLE LIQUID
Benzene	3	UN1114	II	FLAMMABLE LIQUID
Calcium Chloride	5.1	UN1453	II	OXIDIZER
Diesel	3	NA1993	III	
Hydrated Lime				
Mercury	8	UN2809	III	CORROSIVE
Oxygen	2.2	UN1072		NONFLAMMABLE GAS, OXIDIZER
Paint	8	UN3066	II	CORROSIVE
Propane	2.1	UN1978		FLAMMABLE GAS
Stoddard Solvent-Toulene	3	UN1294	III	FLAMMABLE LIQUID

The Hazardous Materials Table identifies the requirements that apply to each shipment of a hazardous material. The table will help the user identify-

- ✓ **HM description and proper shipping names**
- ✓ **Hazard class, identification number, and packing group**
- ✓ **Required labels**
- ✓ **Special provisions**

A. Information in the Hazardous Material Table

Not all the columns apply to our operation. The columns that will be used in this training are 2, 3, 4, 5 and 6. An explanation for these columns is given for your information.

Column 1-Symbols

+	fixes proper shipping name, hazard class and packing group without regard to whether the material meets that class, packing group or other hazard class.
A	applies to materials offered or intended for transportation by aircraft.
D	identifies proper shipping names for describing materials for domestic transportation
W	applies to materials which will be transported by vessel.

Column 2-Hazmat Description and Proper Shipping Names

This column list those materials which are designated hazardous. Use column 2 to find the proper shipping name of the hazardous material to be shipped or the name that most accurately describes the material. Proper shipping names appear in Roman Type not italics.

Column 3-Hazard Class/Division

Designate the hazard class or division of each proper shipping name or the word **Forbidden.** If Forbidden, the material may not be transported unless diluted, stabilized, or incorporated in a device and classed according to definitions in Hazardous Materials Regulations.

Column 4-Identification Numbers

Contains the identification number assigned to each proper shipping name.

UN indicates that the material is appropriate for international and domestic transportation.

NA indicates that the material is appropriate for domestic and Canadian transport only.

Column 5-Packing Group

Packing groups are assigned according to their proper shipping name and hazard class and indicate the degree of danger the materials presents.

Packing Group

I-Great Danger
II-Medium Danger
III-Minor Danger

Column 6-Labels

Hazard warning label conforming to the hazard class (column 3) and the proper shipping name (column 2) are required unless the item is exempt from labeling.

Column 7-Special Provisions
Identifies special provisions for transporting.
Column 8-Packaging Authorizations
This column contains three types of packaging authorizations: exceptions, non-bulk packaging, and bulk packaging.

Column 9-Quantity Limitations

Column 10-Vessel Stowage Requirements

3. Shipping Papers

Whenever a hazardous material is transported, its description must appear on the shipping papers.

Complete instructions for shipping papers appear in the Hazardous Materials Regulations, Part 172, Subpart C: Shipping Papers.

An example of a shipping paper used for the Nuclear Gauge is on the next page.

MONTANA DEPARTMENT OF HIGHWAYS

TRANSPORTATION CERTIFICATE FOR NUCLEAR GAUGE

FROM

TROXLER
EMERGENCY CONTACT:
919-549-8308

MODEL: _____

SERIAL #: _____

DESTINATION

DATE: _____

TIME: _____

RQ:

NATURE AND QUANTITY OF CONTENT					PACKAGE			
Proper Shipping Name	Radio-nuclid	Group	Form	Activity		Category	Transport Index	Type
For U.S. Shipments See Section 2 CAB 82, Tariff 6-D	Name Or Symbol of Principal Radioactive Content	Group Number of Groups I To VII	Chemical Form And Physical State (Gas/Liquid/Solid) or Special Form, or Special Encapsulation	Number Of Curies,	Number Of Packages	I-White or II-Yellow or III-Yellow Label	For Yellow Label Categories Only	Industrial or Type A, or Type B
Radioactive Materials, Special Form (n.o.s.) IATA Article # 2129	Cesium-137 Americium-241: Beryllium	III I	Special Form	____ ____	I	II-Yellow	____	Type A

This certifies that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, labelled and in proper condition for transportation according to applicable national government regulations.

SIGNATURE _____

Shipping Paper

Container Type	HM	Basic Description	Total Quantity	Weight
TT	RQ	Cutback Asphalt, 3, NA 1999, PG III, Flammable Liquid	300 gal.	
		Farmers Union Exchange- Phone- (406) 628-4518		

The shipping paper description must adhere to the following requirements:
A basic shipping description must include proper shipping name, hazard class or division from column 3, identification number from column 4, packing group, and total quantity.

1. If a hazardous material and non-hazardous material are described on the same shipping paper, the hazardous materials must be listed first, shown in contrasting color, identified with an X or RQ before the proper shipping name in the column marked HM.

2. Must be able to read the entry.

3. The description may not include codes or abbreviations.

4. Any additional information must follow the basic description.

5. Must contain the name of the shipper.

6. Shipping paper must show an emergency response telephone number.

7. Shipping papers must contain shipper's certification.

4. Labels

Hazardous materials warning labels are designed and color-coded so that the hazards can be quickly recognized. Warning labels correspond to the placards that must appear on each bulk packaging, freight container, unit load device, and transport vehicle. The labels must include both the hazard class and the division of hazard according to the Hazardous Materials Table. Unless exempt, all hazardous material packages must be labeled.

A. Labeling of Hazardous Materials

Labels on chemical containers are your guide to safety. Labels on a chemical container alert you to the chemicals' hazards and information on how to protect yourself. Used in combination with material safety data sheets, labels give you the information and guidance you need to stay safe and healthy when working with hazardous chemicals. There are a number of different labeling systems.

B. NFPA Labels

The National Fire Protection Association, for example, uses colors, numbers and

abbreviation to deliver a safety message. When you look at NFPA label, you know what the chemical is, what its hazards are, and what hazards require the most care and caution.

In this system, the following colors mean-

- **Red means fire hazard**
- **Yellow means reactivity hazard**
- **Blue is a health hazard**

The system uses numbers to tell you how dangerous the hazard is. The number "1" means slightly hazardous, while the number "4" means deadly.

The white space on the label gives you specific information about special hazards.

✓ **OX** **-chemical which is an oxidizer that should be kept away from flammable substances**

✓ **ACID** **-acid-corrosive**

✓ **COR** **-chemical which is corrosive**

✓ **W** **-chemical which should not be used with water**

✓ **-radioactive**

C. Color Bar Labels
Another labeling system uses colored bars with the same code system as the NFPA. The color bar labels also give a section which tell what personal protective gear to wear when working with chemicals. Though this information is available on MSDS, it is useful to know on the spot.

D. Other Labels
Labels often use a combination of words and symbols to get their message across. They start with the name of the chemical and the manufacture's name, address, and phone number if you need specific information in case of emergency.

The most important information on the label is the hazard warning: flammable, poisonous. The label uses key words to tell you the degree of hazard:

- **Danger-chemical can cause immediate serious injury or death**
- **Warning-potentially serious injury or death**
- **Caution-potentially moderate injury**

Chemical labels must also tell people who work with the chemicals exactly what kinds

of health hazards the chemical presents. Words for health hazards include-

- **Toxic-poisonous chemicals**
- **Carcinogen-chemical that could cause cancer**
- **Corrosive-chemical can burn the skin or eyes on contact, lung, and nose if inhaled**

E. Other Information on Label
Labels may also give first-aid procedures to follow when exposed to the chemical. In many cases, the degree of injury can be reduced.

Labels also provide information on storing and handling the chemical. Example: Use only in well-ventilated area.

F. Using Labels
To have chemical information right at hand-

✓ **Make sure that every chemical you use carries a label.**

✓ **Replace any label that comes off or that can't be read.**

✓ **When transferring a chemical into a smaller container, label the container so that everyone knows what's inside.**

5. Placards

Hazmat placards are similar to the shape, color, and design of hazmat warning labels. The purpose of placards is to alert the public to potential dangers and to guide emergency personnel response to hazmat incidents. (See placards are shown on p. VIII of Emergency Response Book. The list of DOT Hazardous Materials Classification are on the next page.

DOT Hazardous Material Classifications

Hazard Class or Division	Label Name	Placard Name
1.1 1.2 1.3 1.4 1.5 1.6	Explosive 1.1 Explosive 1.2 Explosive 1.3 Explosive 1.4 Explosive 1.5 Explosive 1.6	Explosives 1.1 Explosives 1.2 Explosives 1.3 Explosives 1.4 Explosives 1.5 Explosives 1.6
2.1 2.2 2.3	Flammable Gas Non-Flammable Gas Poison Gas	Flammable Gas Nonflammable Gas Poison Gas
3	Flammable Liquids Combustible liquids	Flammable Combustible
4.1 4.2 4.3	Flammable Solids Spontaneously Combustible Dangerous when Wet	Flammable Solid Flammable Solid Dangerous when Wet
5.1 5.2	Oxidizer Organic Peroxide	Oxidizer Organic Peroxide
6.1 6.2	Poison Infectious substance	Poison
7	Radioactive	Radioactive
8	Corrosive	Corrosive
9	Class 9	Class 9

6. Performance Oriented Packaging

The proper packaging of hazardous materials is crucial to the safety of everyone involved in their handling and transport. Each hazmat package must be designated and manufactured so that when it is filled to its limit, closed, and under normal transportation conditions:

1. The hazardous materials will not be released from the package.

2. The impact, resistance, and strength of package will not be changed due to temperature variations.

3. Gases/vapors will not effect the packaging.

Packages for hazmat materials must be properly marked with ID and special requirements, tested and approved prior to use, and have a manufacturer's mark on each package.

7. Proper Loading and Securement Techniques

Specific information on loading and storing hazardous materials is located in Hazardous Materials Regulations Part 17.

If your work involves loading and securing hazardous materials, you must be aware of the following:

A. Separation distances are established for transporting radioactive materials and are required for people and cargo compartment dividing petitions.

B.Segregation of Hazardous materials-Certain hazardous materials cannot be carried on the same load. A Segregation Table provides a reference for segregating certain hazardous materials.

Blank space	Materials can be loaded together
Letter X	Materials can not be loaded together
Dot •	Explosives can not be loaded together
Letter 0	Materials can not be loaded together unless separated by four feet and must be at least 10 centimeters off the floor. Segregation Table is on next page.

Segregation Table for Hazardous Materials

Class/Division	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 A	2.3 B	3	4.1	4.2	4.3	5.1	5.2	6.1	7	8
Explosives-1.1,1.2	•	•	•	•	•	X	X	X	X	X	X	X	X	X	X	X	X	X
Explosives-1.3	•	•	•	•	•	X		X	X	X		X	X	X	X	X		X
Explosives-1.4	•	•	•	•	•	0		0	0	0		0				0		0
Explosives-1.5	•	•	•	•	•	X	X	X	X	X	X	X	X	X	X	X	X	X
Explosives-1.6	•	•	•	•	•													
Flammable gas-2.1	X	X	0	X				X	0							0	0	
Non-toxic, non-flammable gases-2.2	X			X														
Poisonous Gas A-2.3	X	X	0	X		X				X	X	X	X	X	X			X
Poisonous Gas B-2.3	X	X	0	X		0				0	0	0	0	0	0			0
Flammable Liquids-3	X	X	0	X				X	0					0		X		

Class/Division	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 A	2.3 B	3	4.1	4.2	4.3	5.1	5.2	6.1	7	8
Flammable Solids-4.1	X			X				X	0							X		0
Spontaneously combustible materials-4.2	X	X	0	X				X	0							X		X
Dangerous when wet materials-4.3	X	X		X				X	0							X		0
Oxidizers-5.1	X	X		X				X	0	0						X		0
Organic peroxides-5.2	X	X		X				X	0							X		0
Poisonous liquids-6.1	X	X	0	X		0				X	X	X	X	X	X			X
Radioactive materials-7	X			X		0												
Corrosive liquids-8	X	X	0	X				X	0		0	X	0	0	0	X		

General Awareness Test

Directions: Read each statement carefully and circle the response that best answers the question.

1. Containers for hazardous materials must be-
   A. Leak-proof, marked with ID numbers, and tested to use.
   B. Leak proof, color-coded, and marked with ID numbers.
   C. Color-coded, and marked with ID numbers.
   D. None of the above.

2. All emergency information regarding a hazardous material must include-
   A. Emergency telephone number.
   B. Be accessible to workers.
   C. Be printed in English and available at a location away from the hazmat package.
   D. All of the above.

3. A hazmat employee is defined as one who-
   A. Works for the Montana Department of Transportation.
   B. Has a direct affect on the safe transportation of hazardous materials.
   C. Works in the loading and storage of the department.
   D. Works in the trucking industry.

4. In the Hazardous Materials Table, the packing group is an indication of:
   A. The size of the hazmat packaging.
   B. The weight of the hazmat packaging.
   C. The degree of danger the material presents.
   D. The size and the weight of the hazmat packaging.

5. The proper entry of hazardous material on a shipping paper must show-
   A. The emergency response phone number, the name of the shipper, the basic description of the material and the ID number.
   B. Only the description.
   C. Only the shipping name and ID number.
   D. Description and emergency response phone number.

6. Placards must be placed-
   A. One each side and each end of the hazardous material package.
   B. On each side and each end of the transport vehicle.
   C. On the top of the hazardous material package.
   D. On the rear of the transport vehicle.

7. The NA in the identification number refer to
   A. Not applicable.
   B. The fact that the material is appropriate for domestic and Canadian transport.
   C. The fact that the material is appropriate for international and domestic. transportation.
   D. The fact that the material can't be transported.

8. Hazmat warning labels list-
   A. The contents, weight, and destination of the hazmat package.
   B. The description, weight and destination of the hazmat package.
   C. The correct class and division of hazard of the hazmat package.
   D. Warning labels are color-coded only.

9. Placards are designed
   A. To correspond to labels.
   B. Colored coded so hazards can be quickly recognized.
   C. With hazard class and division.
   D. All of the above.

10. The time to check a chemical container label is:
   A. Before you put the container away.
   B. While meeting legal requirements.
   C. Before you start any job involving the chemical.
   D. After you've been exposed to the chemical.

11. On National Fire Protection Association labels, red means fire hazard and
   A. Green means health hazard and purple means explosion hazard.
   B. White means no hazard.
   C. Blue means health hazard.
   D. Yellow means flammable/combustible.

12. When numbers are used on a label to indicate the degree of hazard:
   A. 1 is slightly hazardous and 4 is deadly.
   B. 4 is slightly hazardous and 1 is deadly.
   C. 1 is slightly hazardous and 10 is deadly.
   D. Number system refers to environmental issues.

13. **Danger** on a label means the chemical can cause:
   A. Headaches.
   B. Potentially moderate injuries.
   C. Immediate serious injury or death.
   D. Slight burns to the skin.

14. The word **toxic** on a label means:
   A. The chemical can poison you.
   B. The chemical can catch fire.
   C. Don't mix the chemical with water.
   D. The chemical will burn your skin.

15. When you transfer a chemical from a large to a small container:
   A. Do the job in a clean storage area.
   B. Tell other workers what's in the small container.
   C. Label the small container.
   D. Don't worry about the chemicals.

Safety Training

1. Introduction

Safety training is intended for any hazmat employee who handles or transports packages of hazardous materials and could therefore be potentially exposed to such materials in an accident/incident.

This training is a basic safety training to those with limited emergency responsibilities.

Goal

To ensure that each hazmat worker knows what to do in the event of a hazardous materials incident/accident.

Objectives

1. Participants will demonstrate how to use the **Emergency Response Guidebook**.
2. Participants will demonstrate knowledge of MDT Emergency Response.

2. Dealing with a Hazmat Emergency

Dealing with a hazmat emergency is crucial. At MDT, we have chances for exposure within our facilities and out on the road. This training is in no way intended to meet the requirements of hazmat employees whose primary function is emergency response. It is simply meant to provide basic safety training to those with limited emergency responsibilities.

If you are exposed to hazardous material incident/accident during the course of your work, you may need to know the following about emergency response:

A. Before you do anything about an hazardous material incident, you need to know the basic description and proper shipping name of hazardous material.

B. You need the following information about the hazardous materials involved:

- immediate hazards to health
- risks of fire and exposure
- immediate precautions needed in case of an incident/accident
- who to contact in case of an incident/accident
- how to clear the area
- preliminary first aid including how to use a fire extinguisher
- emergency response number

C. This information must be available away from the package containing the hazardous materials. You can find this information from:

- Shipping papers

- **Emergency Response Guidebook**
- Material Safety Data Sheet

3. MDT Emergency Response

The red cards indicate the guidelines for establishing procedures for first responders.
The following are the procedures for hazardous materials initial emergency response.

MONTANA DEPARTMENT OF TRANSPORTATION
PROCEDURES FOR HAZARDOUS MATERIAL SITE
EVALUATION & RESPONSE INITIATION

The following guidelines have been established to protect all employees in the event of hazardous material spill incident:

1. Secure the site; control traffic.
2. Notify the nearest area office; give location.
3. Protect yourself, use a safe approach.
    - Approach from upwind, if possible.
    - Do not walk in or touch any spilled material.
    - Avoid inhaling fumes, smoke or vapors.
    - Do not assume that no noticeable smell indicates safety.
4. Identify the hazard if possible.
    - Relay information to area office.
    - Ask yourself:
        - Is rescue your immediate problem?
        - Is rescue really possible with the resources you have?
5. Request further aid and assistance from area office.
6. Enter the site only when you know enough and have the resources to do so safely.
7. Area office will:
    - Notify the L.E.P.C. (Local Emergency Planning Committee) phone _____
    - Notify S.E.R.C. (State Emergency Response Commission) State D.E.S. (Disaster Emergency Services) 444-6911.
    - Notify Chief Maintenance Engineer 444-6158.
    - Continuously update L.E.P.C./incident commander, S.E.R.C. State D.E.S. and Chief Maintenance Engineer.
8. Chief Maintenance Engineer will:
    - Notify Director.
    - Continuously update the Director.
9. On-Scene coordinator will;
    - Coordinate State agency response.
    - Coordinate with local incident commander.
    - Assume control of hazardous material incident until relieved by local government.

It is important the you follow the Hazardous Materials Checklist, the L.E.P.C. and S.E.R.C. State D.E.S. will request this information from the area office when they are called.

4. Emergency Response Guidebook

Our workers have the potential of being exposed to hazardous materials during a hazmat incident/accident within the work place and on the road.

The **Emergency Response Guide** is an excellent tool for guiding actions in a haz mat emergency.

Look at page i in the guidebook. The first statement in that book is bolded and underlined.

RESIST RUSHING IN!

APPROACH INCIDENT FROM UPWIND

STAY CLEAR OF ALL SPILLS, VAPORS, FUMES AND SMOKE

5. How to Use the Emergency Response Guidebook

A. The guide is divided into color-coded parts:

Yellow pages: list hazardous materials by ID number

Blue pages: list hazardous materials alphabetically

Orange pages: guide numbers for emergency response information

Green pages: initial isolation and protective action distances

B. Using the guide:

1. Identify the material

a. Find one of the following:

✓ 4 digit ID number on a placard or orange panel

✓ 4 digit ID number (list after UN or NA) on a shipping paper or package

✓ name of material on a shipping paper, placard, or package

b. If you cannot locate the ID number or name:

✓ try to find a placard like it in the table of placards. Refer to the two digit guidebook

C. If you cannot find any reference to a guide, but you believe the incident involves a hazardous material, turn to Guide 11 and use that until more

information is available.

D. Find the material's 2 digit guide number using:
a. yellow ID section
b. blue name section

Guide numbers for explosive hazardous materials are printed in the middle of the first page of the guide.

If an entry is highlighted in yellow or blue section turn to green section: **Initial Isolation and Protective Active Distances** for information.

Group Activity 2
List the hazardous materials you come in contact with during your work and provide the guide number for each.

Hazardous Material	Guide Number

6. Protective Equipment
For the hazardous materials above what protective equipment do you need to have when working with each of these materials?

7. Hazardous Materials Considerations
When coming across an accident as a first responder and you don't see any placards, assume there might be hazardous material involved.

A. You, as the first responder, are hampered by limited knowledge.

B. There are no routine incidents.

C. Chemical exposure can have lasting effects on your health.

D. Hazardous materials are everywhere.

Example: Gasoline is common at transportation incidents. One gallon, when vaporized and ignited, has the explosive heat of 20 sticks of dynamite.

E. Some common products are deadly when mixed.

Example: Semi hauling grocery supplies will not be placarded, but could contain lethal combinations such as ammonia and chlorine bleach.

8. Detecting the Presence of Hazardous Materials.

Detecting the presence of a hazardous material is the first step in the response sequence.

A. Interpreting outward warning signs

Observing any of these outward warning signs should serve as an immediate **RED FLAG** to emergency responders assessing the incident scene.

- ✓ collapsed victims
- ✓ people running from a hazardous area
- ✓ birds and insects dead around site
- ✓ hissing sound
- ✓ flames or smoke

B. Searching for detection clues.

Be alert to clues that indicate the likely presence of a hazardous material.

1. Container shapes.
What type of containers/vehicles would you suspect would carry hazardous materials?

2. Marking & color
Colors refers to colored marking systems like the National Fire Protection Association's Standard 704-blue for health, red for flammability, and yellow for reactivity.

3. Placards & labels
Placards are found on front rear and side of containers and vehicle. Labels are on containers.

Color of placard indicates the major hazard class. Single digit on some placard indicates the hazardous class. UN numbers indicate a particular hazardous material. Placards also have symbols which indicates hazardous materials.

Group Activity 3

You have come upon an accident on a two-lane highway. A semi is overturned in one lane of traffic. There is a small fire on the site. The victim from the accident is twenty-five feet from the truck. The truck has a placard marked UN2672. What does the **Emergency Response Guidebook** say your response is? What should you do as far as MDT Emergency Response Guidelines.

Safety Test

You will need to use the **Emergency Response Guidebook** for parts of the test.

1. The primary goal of safety training is to:
   A. Prevent you from being injured or allowing others and the environment to be injured.
   B. Comply with state and federal law.
   C. Identify what hazardous materials are and the risks associated with them.
   D. Identify the potential outcomes of incidents involving hazardous materials.

2. All emergency information regarding a hazardous material must:
   A. Contain an emergency telephone number.
   B. Be accessible to workers.
   C. Be printed in English and available away from the hazmat package.
   D. All of the above.

3. When dealing with vapors, fumes, and smoke:
   A. Stay clear only if you know the material is hazardous.
   B. Stay clear and assume the material is hazardous.
   C. Approach slowly after covering your mouth and nose.
   D. Approach slowly after calling for assistance.

4. The orange pages of the **Emergency Response Guidebook** contain:
   A. A listing of hazardous materials by ID number.
   B. An alphabetical listing of hazardous materials.
   C. Initial isolation and protective action distances.
   D. Emergency response information.

5. If an entry is highlighted you should:
   A. Be prepared to leave the area immediately.
   B. Turn to the orange pages for emergency response information.
   C. Turn to green pages: initial isolation and protective action distances.
   D. No material is highlighted.

6. At a minimum, safety training must include:
   A. How to isolate a spill.
   B. Knowing whom to call in case of a hazmat emergency.
   C. How to use the **Emergency Response Guidebook.**
   D. Both B and C.

7. If you cannot find either the ID number or name of a spilled material that you believe is hazardous:
   A. Use Guide 11 until you receive more information.
   B. Take no action until you receive more information.
   C. Leave the area immediately.
   D. Select any of the guide numbers used for explosives.

8. The green pages of the **Emergency Response Guide** provide:
   A. A listing of hazardous materials by ID number.
   B. An alphabetical listing of hazardous materials.
   C. Initial isolation and protective action distances.
   D. Emergency response information.

9. You find a material's 2-digit guide number in the **Emergency Response Guidebook** by:
   A. Using the yellow pages (ID index).
   B. Using the blue pages (name index).
   C. Looking on the shipping paper or MSDS
   D. Either A or B.

10. N.O.S. means:
   A. Not an organic substance.
   B. Not otherwise specified.
   C. Not other wise safe.
   D. No other signs.

11. The most dangerous clue that emergency responders can utilize to attempt to detect and identify hazardous materials is:
   A. Their senses.
   B. The container markings.
   C. Shipping papers.
   D. Occupancy or location.

12. Which emergency action guide should the emergency responders use for the material identified in these shipping papers below?
   A. 12
   B. 19
   C. 26
   D. 69

033V1	1	RQ	Ethylene Oxide		
			Flammable gas		
			UN 1040		
			Emergency contact: (800) 424-9300 .		

13. The initial isolation distance for a spill or leak from the container (UN 2199) if there is no fire would be how far in each direction?
   A. 500 feet
   B. 1500 feet
   C. 0.2 miles
   D. 0.5 miles

14. On placard feature most visible from a distance is the-
    A. Color
    B. Symbol
    C. Hazard class
    D. Hazard class number

15. First responders should initially attempt to detect the presence of hazardous materials at an incident by-
    A. Calling Chemtrec.
    B. Looking at the scene from a distance.
    C. Driving or walking into the incident and looking for outward warning signs.
    D. Locating the shipping papers.

Function Specific Training

1. Introduction

Function specific training is intended to teach the skills needed for a specific haz mat job assignment.

Objectives

Increase the awareness of safety considerations and regulatory requirements, thereby reducing the occurrence of hazardous materials incidents caused by human error.

This section is completely dependent upon the hazmat job duties you have in the department:

2. Material Safety Data Sheets

OSHA Hazardous Communications Standards require that each employer provides their employees with information on what hazardous materials you are working with, why it's hazardous, and how to protect yourself from potential hazards.

A. Identify And Hazardous Ingredients

There are different MSDS formats, but OSHA requires that certain information on the MSDS. This section covers the information required on the MSDS. Each MSDS needs to have-

- **the name of the chemical**
- **name and address of company providing the chemical**
- **manufacture's phone number to call for advice in case of emergency**

Many chemicals have more than one hazardous ingredient, and the second section of the MSDS tells you exactly what they are. It also tells you what level of exposure to each ingredient is considered safe.

B. Physical and Chemical Characteristics

This section of the MSDS data sheet covers physical and chemical characteristics of the substance. This information will help you avoid trouble. It includes normal odor, so you can avoid abnormal odor which might be dangerous. It includes characteristics such as ***boiling point, melting point, vapor pressure and density, and solubility in water.***

C. Fire and Explosion Data

The MSDS provides information on how to prevent fires and explosion. This section tells the chemical's ***flash point***, *the lowest temperature at which a chemical will ignite*. If a substance has a very low flash point, as gasoline does, you know you have to take steps to prevent fires or explosions even in freezing weather.

If there is a fire, this section of the MSDS also tells you whether to use water, CO2, or foam to put it out.

D. Reactivity Data

The next MSDS section covers reactivity, and explains what happens when a chemical mixes with a substance (such as air, water, or another chemical) that can

cause a dangerous reaction. Some chemicals will burn, explode, or release toxic vapors when they react with other specific substances. This sections will tell you to keep a chemical that's highly reactive to water stored in a closed dry drums.

E. Health Hazards
This section covers how the chemicals could effect you, if you are overexposed to them. Chemicals listed as **toxic** could be poisonous to inner organs such as the kidney. **Corrosives** will burn the skin or the eyes. **Carcinogens** are chemicals suspected of causing cancer.

This section also covers the long-term effects and the short-term effects that is created by immediate exposure. The health hazards section tells how you can be exposed such as by swallowing, inhaling, contact with the skin or eyes. It also covers the symptoms of exposure. This could mean reactions such as headaches, dizziness, or a skin rash. The MSDS describes first aid procedures for exposure.

F. Precaution for Safe Handling and Use
The MSDS also gives directions for safe handling and use. It also includes how to store the chemical properly. The MSDS gives information on how to clean up spills and dispose of the waste it creates. The MSDS and a contingency plan can prevent spills from getting out of hand.

G. Control Measures
The last section of the MSDS include the ***personal protective equipment*** you should wear to protect yourself from chemical hazards. The MSDS will tell you to wear gloves, respirators, or protective suit, <u>whatever you need to be safe</u>.

This section also explains proper hygiene procedures to follow, such as washing your hands or clothes after working with the chemical. This can help reduce your exposure and prevent health hazards.

Group Activity
At the end of this chapter are Material Safety Data Sheets for hazardous material with which you might be working. Use the MSDS for hydrated lime to help answer the following questions:
1. What are the hazards associated with this material?

2. What are the major health hazards for this material?

3. What is the first aid procedures if the material is in the eyes?

4. What protective equipment should a person wear when working around this material?

3. Fire Extinguisher

A. The index has charts on types of fires and type of extinguisher to use with each type of fire. MDT uses dry chemical fire extinguisher, ABC. The ingredients in dry chemical fire extinguisher are nontoxic. However, discharging large quantities may cause temporary breathing difficulties and may interfere with you ability to see what's going on.

When fighting a small fire, hold the nozzle as close to the base of the flames as you can without burning yourself. Shoot short sweeping bursts of the chemical across the flame base. Remember that a fire extinguisher is for use on fires that have just begun, not on raging inferno. If it's shooting in the air, don't even try to fight it. Clear the area so you won't be burned.

From **Safety Management-Number 374**

Practice beforehand makes panic less likely during emergency. Proper operation of for extinguisher are important. People don't realize the enormous pressure in a fire extinguisher-normally 125 pounds of pressure. As a result, when people use an extinguisher on a fire, they often wind up blowing the fire back on themselves and may create an even bigger blaze. An example of this was an employee who was trying to help, pulled the fire extinguisher off the wall and sprayed it directly on the fire. The fire blew back at him and ignited nearby curtains. The injuries the employee sustained and the additional fire damage might have been minimized had the employee been trained in proper extinguisher handling.

B. Classes of Fires

Class A-Fires that occur in ordinary combustible materials such as rags, wood, and rubbish.

Class B-Fires that occur with flammable liquids.

Class C-Fires that occur in electrical equipment such as motors.

Class D-Fires that occur with combustible metals such as magnesium.

Function-Specific Test

1. What does the word **flash point** mean?
   A. The temperature that the material will ignite and burn by itself.
   B. The boiling point of water.
   C. The temperature of 78° F.
   D. None of the above.

2. Information on flash point of asphalt can be found:
   A. On the tank.
   B. In the material safety data sheet.
   C. From contractor
   D. Don't have to worry about flash points.

3. What type of fire extinguisher would you use with a flammable liquid such as gasoline, oil, grease, paint, and thinners?
   A. Class A
   B. Class B
   C. Class C
   D. Class D

4. Use a fire extinguisher:
   A. At the beginning of a fire.
   B. When the fire is a shooting inferno.
   C. When the tar pot/crack sealer is about to blow.
   D. All of the above.

5. You can get information on the materials you use from-
   A. Shipping papers.
   B. Emergency Response Guidebook.
   C. Material Safety Data Sheet.
   D. All of the above.

6. The MSDS section on reactivity describes:
   A. The chemical's reaction to other chemicals, air, or water.
   B. The chemical's reaction to being kept in storage too long.
   C. Your skin's reaction to the chemical.
   D. Hazardous ingredients and permissible exposure levels.

7. You can be exposed to a chemical by:
   A. Swallowing it, inhaling it, absorbing it through the skin, or getting it in your eyes.
   B. Reading the MSDS.
   C. Working for a chemical company.
   D. All of the above.

8. MSDS (Material Safety Data Sheets) should be kept:
   A. In a locked file cabinet.
   B. In a location convenient to anyone who uses chemicals.
   C. At the chemical manufacturer's facility.
   D. In the MDT safety office in Helena.

9. Typical protective equipment for chemical safety includes:
   A. Raincoats and umbrellas.
   B. Hard hats and ear plugs.
   C. Protective gloves, safety goggles, and respirators.
   D. Shorts, sandals, and muscle shirt.

10. A chemical with a low flash point can:
   A. Only catch fire when temperatures are very hot.
   B. Cause skin rashes.
   C. Catch fire at low temperatures.
   D. Are stable around flames.

Using the MSDS for propane, answer the following questions:

11. In the NFPA classification, propane is listed as a no. 4 flammable. This means that propane is-
   A. Not flammable at all
   B. Slightly flammable
   C. Moderately flammable
   D. Extremely flammable

12. What is the flash point of propane?
   A. 100° F
   B. -156° F
   C. 52° C
   D. 212° F

13. What are the health hazards that might be associated with overexposure to propane?
   A. Frostbite
   B. Respiratory irritation
   C. Asphyxiation
   D. All of the above.

14. How should propane be handled and stored?
   A. Keep away for heat & ignition sources.
   B. Check often for corrosion, leaks, dents on the bottom.
   C. Store cylinders in upright secured position.
   D. All of the above.

15. What label needs to be on the propane tanks?
   A. Liquefied Petroleum Gas
   B. Flammable Liquid
   C. Flammable Gas
   D. None of the above

EM SCIENCE
111 Woodcrest Road, P.O. Box 5018, Cherry Hill, N.J. 08034-0395, Phone (609) 354-9200

MATERIAL SAFETY DATA SHEET

Essentially Similar to U.S. Department of Labor Form OSHA-20

SECTION 1 NAME & PRODUCT

Chemical Name: Calcium Hydroxide

Catalog Number: CX0220, 0225

Trade Name & Synonyms: Hydrated Lime, Calcium Hydrate, Slaked Lime

Chemical Family: Weak Alkali

Formula: $Ca(OH)_2$

CA #1305-62-0

Formula Weight: 74.10

SECTION 2 PHYSICAL DATA

Boiling Point, 760 mm Hg (°C)	N/A	Specific Gravity (H_2O = 1)	2.34
Melting Point (°C)		Solubility in H_2O, % by wt. at 20°C	Slight
Vapor Pressure at 20°C		Appearance and Odor	white odorless powder
Vapor Density (air = 1)			
Percent Volatiles by Volume		Evaporation Rate (Butyl Acetate = 1)	

SECTION 3 FIRE AND EXPLOSION HAZARD DATA

Flash Point (test method)	Flammable Limits	Lel	Uel

Extinguishing Media

Special Hazards and Procedures

Unusual Fire and Explosion Hazards

SECTION 4 REACTIVITY DATA

Stable	X	Conditions to Avoid
Unstable		Absorption of CO_2 from air

Materials to Avoid

( ) Water ( ) Acids ( ) Bases ( ) Corrosives ( ) Oxidizers

(√) Other (specify) Nitroparaffin compounds, Maleic anhydride

Hazardous Decomposition Products

SECTION 5 SPILL OR LEAK PROCEDURES AND DISPOSAL

Steps to be Taken in Case Material is Released or Spilled: Sweep up and containerize for disposal

Waste Disposal Method: To be performed in compliance with all current local, state and federal regulations

CX0220, 0225

SECTION 6 HEALTH HAZARD DATA

Threshold Limit Value

TLV - air: 2 mg/m³

TXDS: orl-rat LD50: 7340 mg/kg

Effects of Overexposure

Irritating to skin and respiratory system.
May cause dermatitis and severe eye irritation.

First Aid Procedures

Skin: wash with soap/water
Eyes: flush with warm water; get medical assistance
Inhalation: remove to fresh air; get medical assistance
Ingestion: get medical assistance

SECTION 7 SPECIAL PROTECTION INFORMATION

Ventilation, Respiratory Protection, Protective Clothing, Eye Protection

Provide adequate general mechanical & local exhaust ventilation
Protect eyes and skin with safety goggles and gloves
Dust respirator may be required
DO NOT BREATHE DUST
DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING

SECTION 8 SPECIAL HANDLING AND STORING PRECAUTIONS

Keep container tightly closed.
Store in a cool, well-ventilated area away from sources of ignition

DOT - ORM - B (Air)

SECTION 9 HAZARDOUS INGREDIENTS

(refer to section 3 through 8)

SECTION 10 OTHER INFORMATION

pH of saturated aqueous solution at 25°C is 12.4

EMERGENCY PHONE NUMBER (609) 423-6300

AUTHORIZED SIGNATURE _____

DATE ISSUED 9/81

PETROLANE MATERIAL SAFETY DATA SHEET

P.O. Drawer 1410 - 1600 E. Hill St., Long Beach, CA 90801
Contact: Safety Department - Telephone: (213) 427-5471

I. Warning Statement

DANGER! Extremely Flammable.
Vapor reduces oxygen available for breathing and may cause suffocation in confined spaces.
Liquid may cause freeze burn similar to frostbite.

II. Product Identification

Product Name: Petrolane Propane
Chemical Name: Propane
Synonyms: LP-Gas, Bottled Gas
Chemical Family: Paraffinic Hydrocarbon
Chemical Formula: C_3H_8

CAS Reg. No.: 74-98-6

Transportation Emergency Telephone:
800-424-9300 (CHEMTREC)

NFPA Classification:

Health	1	Slightly Toxic
Fire	4	Extremely Flammable
Reactivity	0	Stable

III. Hazardous Components

Composition (Typical)	% (approx.)
Propane	92
Propylene	5
Butane	3

Exposure Limits

OSHA PEL for Propane is 1,000 ppm (8 hrs.)
ACGIH TLV: Simple Asphyxiant (propane)

Product is a simple asphyxiant in high concentrations.
Product is not listed as a carcinogen or potential carcinogen by NTP, IARC or OSHA.

IV. Physical Data

Boiling Point: -44°F
Vapor Pressure: 208 psig (max.) @ 100°F
Vapor Density (Air=1): 1.5
Appearance and Odor: Colorless liquefied petroleum gas.
Propane sold for fuel contains a foul smelling warning agent (odorant).

Specific Gravity (H_2O=1): 0.507
% Volatile by Volume: 100%
Solubility in Water: Insoluble

V. Reactivity Data

Stability: Stable
Hazardous Polymerization: Will not occur
Hazardous Decomposition Products: Incomplete combustion can cause carbon monoxide.
Materials to Avoid: Strong oxidizing agents

VI. Fire and Explosion Data

Flash Point (Method Used): -156°F (estimated)
Flammable Limits (% Volume in Air): Lower 2.1% Upper 9.5%

Extinguishing Media: Dry chemical, foam or CO_2 for small fires. Stop flow of gas first.

Special Fire Fighting Procedures and Precautions: Evacuate area. Notify fire department. Allow only properly protected personnel in area. Shut off source of gas, if possible. Allow fire to burn until gas flow is shut off. Adequate water stream can be used to cool exposed equipment and vapor space of containers. Approach a flame enveloped container from the side, never the head ends. For massive, uncontrollable fires and when flame is impinging on vapor space of containers, withdraw all personnel and evacuate surrounding vicinity immediately.

Fire and Explosion Hazards: Products of combustion may yield carbon monxide. Uncontrolled vapors spread rapidly, are heavier than air and are extremely flammable.

April 1986

VII. Handling and Storage Precautions

Store in an authorized location (outside, detached storage is preferred) with adequate ventilation. Keep away from heat and ignition sources. Inspect cylinders frequently for leaks, dents, gouges and corrosion with emphasis on bottom of cylinder. Store cylinders in upright position. Do not drop or abuse cylinders. Keep container valve closed and plugged when not in use. Install protective caps when cylinders are not connected for use.

VIII. DOT Transportation Data

Shipping Name: Liquefied Petroleum Gas
Hazard Class: Flammable Gas
I.D. Number: UN 1075

Marking: Liquefied Petroleum Gas / UN 1075
Label: Flammable Gas
Placard: Flammable Gas / UN 1075

IX. Health Hazard Data

Effects of Overexposure: Liquid can cause freeze burns similar to frostbite if contact with skin occurs. Large concentration of vapor in atmosphere can cause asphyxiation due to oxygen displacement. Inhalation of smaller quantities of vapor can cause respiratory irritation, dizziness, nausea or drowsiness.

X. Emergency and First Aid Procedures

Eye Contact: Flush with water. Obtain medical assistance if contact with liquid has occurred.

Skin Contact: If freeze burn occurs, remove contaminated clothes, shoes and jewelry. Immerse burned area in warm (not hot) water. Keep immersed. Call for medical assistance.

Inhalation: Remove victim from further exposure and into fresh air. Provide oxygen if breathing is labored. If victim is unconscious, seek immediate medical attention. If breathing has stopped, give artificial respiration.

Ingestion: Not expected to occur in normal use.

XI. Personal Protection Information

Ventilation: Use adequate ventilation to maintain exposures below recommended limits.

Respiratory Protection: Use a NIOSH-approved respirator if area is thought to contain unknown concentration of gas.

Eye Protection: Use safety goggles or safety glasses with side shields.

Protective Clothing: No special garments are necessary, but avoid skin contact with liquid because of possibility of freeze burn. Propane resistant gloves are recommended.

XII. Spill or Leak Procedures

Product is extremely flammable. If there is a leak but no fire, do not ignite the gas. Eliminate all ignition sources. Evacuate the area. If possible, remove leaking container to safe area. Stop flow of gas or allow vapor to disperse in a safe area. Use water spray to help dilute vapor concentration in the air.

Dispose of gas only by controlled burning in compliance with local laws and regulations.

XIII. Communication with Employees and Purchasers

This Material Safety Data Sheet (MSDS) alerts the reader to the potential safety and health hazards of propane. It also contains valuable reference material relating to the safe use and handling of the product. Make sure that this information is shared with all employees and purchasers who use or handle the product. It is an important part of the OSHA hazard communication program.